

~~CONFIDENTIAL~~

between lines 6 and 7 insert --SUMMARY OF THE
INVENTION--.

line 13, delete ", incorporating" insert
--includes--.

line 15, delete "liquid" insert --gaseous--;
delete "said" insert --the--.

line 16, delete "said" insert --the--.

line 17, delete "said" insert --the--; delete
"is distinguished by the fact that it" insert --with the ram
jet engine containing--.

line 18, delete "contains"

line 19, delete "means of"; delete ", one"";
insert --. One--.

line 20, delete "which" insert --the--; delete
"said" insert --the--.

line 21, after "other", insert --space--;
delete "; passages", insert --. Passages are--.

line 22, delete "liquid" insert --gaseous--.

line 23, delete ";", insert --,--; delete
"said", both occurrences insert --the--; after "duct" insert
--is--.

line 25, delete "said" insert --the--.

Page 3, line 3, delete "Said" insert --The--.

line 4, after "example" insert --,--.

line 6, after "example" insert --,--.

~~2~~
~~CONFIDENTIAL~~

DECLASSIFIED BY ORIGINATING AGENCY

CONFIDENTIAL

line 25, delete "Patent" insert --Applicants' copending United States--.

line 26, delete "in the applicant's name".

Page 4, line 2, after "," insert --when--; delete "said" insert --the--.

line 3, delete "," insert --. This--.

line 4, delete "this"; delete "said" insert --the--.

lines 6, 7, 8, 10, 17, and 23, delete "said" insert --the--.

line 23, delete ":".

lines 24 and 25, delete in their entirety and substitute therefore the following new paragraphs:

--For example, the above noted elements may be attached by bonding or mechanical attachment or may be molded within the tubular element. Alternatively, such elements may be positioned on a winding mandrel of the tubular elements and thus incorporated into the tubular element during the manufacture by filament winding.

It is also possible for the elements to be built simultaneously at their intended locations within the tubular elements so as to form a monolithic assembly. This being the case when the materials composing the various components are of similar composite materials.

DECLASSIFIED BY ORIGINATING AGENCY

CONFIDENTIAL

a'
Confidential
DECLASSIFIED BY ORIGINATING AGENCY

Additionally, in accordance with the present invention, the components may be grouped into two sub-assemblies so as to obtain first a "combustion-chamber" subassembly made up of the intermediate transverse wall, the thermal protection linings, and the ram jet nozzle; and, second, a "cruising propulsion-unit" sub-assembly composed of components corresponding to the type of ram jet engine chosen.

The above sub-assemblies are then inserted and attached on the inside of the tubular element thereby ensuring the mechanical solidity of the assembly, with the last manufacturing technique being recommended for the cruising propulsion unit which may then be incorporated into a sub-structure manufactured by using filament winding.--

a'
Page 5, lines 1-22, delete in their entirety.

Page 6, line 1, delete ", including:" insert --.--.

lines 2-25, delete in their entirety and substitute therefor the following new paragraphs:

a 2
--For example, one type of ramjet engine may be a simple ram jet engine in which the sub-assembly contains a semi-solid propellant block for cruising and, consequently, can be molded and bonded onto the tubular element.

However, it is also possible in accordance with the present invention to provide a gas-generating ramjet engine generally termed a "separate", engine in which the

DECLASSIFIED BY ORIGINATING AGENCY
Confidential

DECLASSIFIED BY ORIGINATING AGENCY
~~CONFIDENTIAL~~

subassembly contains, in addition to the free semi-solid propellant block, an ignition system and sonic injectors.

It is also possible to provide a liquid-fuel ramjet engine in which the sub-assembly comprises a fuel tank including a fluid-driving generator and injection system.

*A2
cont*

The intermediate transverse partition may, in accordance with the present invention, be made directly unitarily with the rigid tubular element or, inversely, the intermediate transverse partition may be made unitary with the rigid tubular element by one of the two assemblies, for example, the "cruising propulsion unit" and the "combustion chamber".

It is also possible for at least one of the two sub-assemblies constituted in the cruising propulsion unit and the combustion chamber to be manufactured interiorly of the tubular element or, as an alternative, at least one of the assemblies may be manufactured as a module, installed, and attached within the tubular element.

In accordance with still further features of the present invention, the tubular element may be constructed around at least two assemblies made up of the cruising propulsion unit and the combustion chamber and the tubular element may, for example, incorporate inserts for attachment of the air ducts.

The inserts are advantageously provided to attach the ends of the air ducts to the tubular element in an area of

DECLASSIFIED BY ORIGINATING AGENCY
~~CONFIDENTIAL~~

~~DECLASSIFIED BY ORIGINATING AGENCY~~
~~CONFIDENTIAL~~

the combustion chamber and may be made unitary with the intermediate transverse partition.

*a²
Confidential*

Additionally, the combustion chamber may, in accordance with the present invention incorporate a consumable accelerator and the inserts for attaching the ends of the air ducts to the tubular element in the vicinity of the combustion chamber may be shaped so as to form cutting knives so as to enable a cutting of air-fed apertures in the wall of the tubular element at an appropriate moment.-

BRIEF DESCRIPTION OF THE DRAWINGS:

The above and other objects, features, and advantages of the present invention will become more apparent from the following description when taken in connection with the accompanying drawings which show, for the purpose of illustration only, several embodiments in accordance with the present invention, and wherein:--

~~Page 7, lines 1-19, delete in their entirety.~~

~~line 22, delete "." insert ---;---~~

~~line 25, delete "." insert ---;---~~

~~Page 8, lines 3, 4, and 6, delete "." insert ---;---~~

~~line 10, delete "." insert ---; and---~~

lines 14-18, delete in their entirety and substitute therefor the following:

~~DECLASSIFIED BY ORIGINATING AGENCY~~
~~CONFIDENTIAL⁶~~

~~7~~ DETAILED DESCRIPTION

A3
Referring now to the drawings wherein like reference numerals are used throughout the various views to designate like parts and, more particularly, to Fig. 1, according to this figure, a missile, constructed in accordance with the present invention, includes a body 2 rigidly extended toward a rear by a ram jet engine 3 for providing a propulsion for the missile 1. The body 2 includes the usual devices and loads, which are not represented since they are unrelated to the invention. *✓*

line 20, ~~delete "said" insert --the--.~~
line 23, ~~delete "said" insert --the--.~~
line 24, ~~delete in its entirety.~~
line 25, ~~before "ramjet" insert --The--.~~
line 27, ~~after "," second occurrence, insert~~
~~--as shown in Fig. 2,--.~~

A4
Page 9, line 1, delete "(see the enlarged Figure 2):"
insert ~~a rigid tubular element made by filament winding on~~
a mandrel of resistant fibers coated with a hardenable
resin, with an intermediate transverse partition separating
an interior volume of the tubular element into two spaces 9,
10 with a forward space 9, housing the cruising propulsion
unit *2*, with the rearward space 10 being adapted to house a
combustion chamber of the ram jet engine 3. Passages 12 are

DECLASSIFIED BY ORIGINATING AGENCY
CONFIDENTIAL

A4
cut in the transverse partition in order to permit feeding of liquid fuel from the cruising propulsion unit 11 into the combustion chamber. A gas-injection nozzle is fitted at the rear extremity of the rear space 10 opposite to the transverse partition 8. A thermal protection lining 14 covers at least the inner wall of the space 10 whereby the combustion chamber is formed from the nozzle 13 and the thermal protection lining 14.

lines 2-17, delete in their entirety.

Page 10, lines 1, 8, 12, 20, 21 and 25, delete "said"
insert --the--.

line 2, delete "see".

line 6, delete ";" they make" insert --, with
the insert 18 making--.

line 13, after "," insert --with--; delete "of
which is designed to empty" insert --passage 4a, 4b
emptying--.

line 24, delete "this latter" insert --the
tubular element 7--.

line 26, before "patent" insert --copending--.

Page 11, line 4, after "are" insert --,--; after "case"
insert --,--.

DECLASSIFIED BY ORIGINATING AGENCY
CONFIDENTIAL

~~CONFIDENTIAL~~
DECLASSIFIED BY ORIGINATING AGENCY

a5
line 12, delete "13, 14" insert ~~formed by~~
the nozzle 13 and the lining 14.

a6
line 13, delete ":" insert ~~~,~~ the air ducts 4
are blocked by the wall of the tubular element 7 sealing the
opening 20a, 20b at the intake of the combustion chamber
defined by the nozzle 13 and the lining 14. An acceleration
nozzle 25, smaller than the nozzle 13 of the ramjet engine,
is positioned at the outlet of the combustion chamber. The
nozzle may be composed of a simple tube formed in the
accelerator block 16.~~~~~

lines 9-20, delete in their entirety.

line 21, delete "said" insert --the--.

line 25, delete "13, 14".

a1
Page 12, line 10, delete ":" insert --~~inserted and~~
bonded to the inside of the polymerized tubular element 7 or
inserted in the winding mandrel of the element and
incorporated into the element during the winding of the
composite material. Additionally, the partition may be
manufactured using resin-impregnated fabrics set between two
parts of the mandrel and incorporated into the tubular
element 7 when the tubular element 7 is wound so that the
entire unit is polymerized together to form a monolithic
structure. Additionally, the partition may make up the
front extremity of a secondary structure containing all of
the components of the integrated accelerator 16.

~~CONFIDENTIAL~~
DECLASSIFIED BY ORIGINATING AGENCY

~~CONFIDENTIAL~~

lines 11-22, delete in their entirety.

line 23, delete ":" insert -- inserted and

bonded to the interior of the polymerized tubular element 7 or placed in the winding mandrel of the tubular element 7 and incorporated into the tubular element 7 when the composite material is wound. The nozzle 13 may also be formed directly on the mandrel by, for example, winding a fringe of resin-impregnated fireproof material of the type described, for example, in French Patent 8,412,782 of August 14, 1982, or by positioning of specifically-oriented fabrics, then incorporated into the tubular element 7 when the tubular element 7 is wound, with the entire unit being polymerized together so as to form a monolithic structure. It is also possible for the nozzle 13 to be made apart of a secondary structure comprising all of the components of the integrated accelerator 16.

line 24 and 25, delete in their entirety.

Page 13, lines 1-11, delete in their entirety.

line 13, delete ":" insert --, with the first being a conventional approach, which is achieved by molding of the protective liner 14 on an interior of the tubular element 7 after a polymerization of the tubular element 7. It is also possible for the protective lining 14 to be molded around a mandrel polymerized and then wind the tubular element 7 on the assembly thus formed. In this

~~CONFIDENTIAL~~

~~DECLASSIFIED BY ORIGINATING AGENCY~~

A⁹

situation, and if the desired thermal protection is silicon-based, a bonding layer must be laid down on what would be the surface of the thermal protection on which the winding of the tubular element 7 will take place. Additionally, the protective lining 14 may be installed by placing a layer of several millimeters thick, for example, 4 to 12 of a fiber-resin material on the mandrel. The fibers may be made of a silica or silicon carbide, and the resin must be compatible with that used in the tubular element 7.--.

lines 14-25, cancel in their entirety.

Page 14, line 8, delete "-".

line 13, after "without" insert --an--.

line 16, delete "combustion chamber" insert
--space--; after "10" insert --housing the combustion
chamber--.

line 23, delete "means of".

Page 15, line 5, delete "said".

Page 16, line 2, delete "In consequence" insert
--Consequently--.

line 9, delete "chamber" insert --space--.

Page 17, line 3, delete "chambers" insert --spaces--.

line 14, delete "said" insert --with the--

~~DECLASSIFIED BY ORIGINATING AGENCY~~
CONFIDENTIAL

line 18, delete "said" insert --the--.

line 25, after "example" insert --,--.

Page 19, line 7, delete "; this latter" insert --. The cylindrical--.

line 13, delete "means of" insert --a--.

Page 20, line 13, delete "20 b" insert --20b--.

line 16, delete "; it" insert --, and the cover 70--.

Page 21, line 6, delete "; next" insert --. Next--.

Page 25, delete "DESCRIPTIVE SUMMARY" in its entirety and substitute therefore the Abstract of the Disclosure as contained on the attached sheet.

~~DECLASSIFIED BY ORIGINATING AGENCY~~
CONFIDENTIAL